photomultiplier power base (negative)
PS1817 data sheet

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1 description

The PS1817 is a compact photomultiplier power base incorporating a negative high voltage supply and an active voltage divider. It is suitable for use with all 11 stage, 52 mm diameter, hardpin photomultipliers with an overall voltage range of -100 to -1800 V. It is available in two versions: the PS1817/5 operates from a +5 V supply and the PS1817/12 requires +12 V.

It is housed in a cylindrical metal enclosure to provide electrical screening. Low voltage connections are by 500 mm long insulated leads, and the anode output is via a 500 mm long RG174U screened coaxial cable.

The internal high voltage provides power to an active divider, comprising a series of lower power FETs. Dynode potentials are generated directly on the pins of a B19A photomultiplier tube socket.

The overall operating voltage for the photomultiplier can be precisely set using any one of the three programming options shown in section 9.

2 applications

The PS1817 is suitable for the following applications:

analogue
pulsed light
photon counting

3 features

compact design
freedom from high voltage cables
extremely low ripple
exceptional voltage divider stability with varying anode current
excellent pulse height linearity
sleep mode

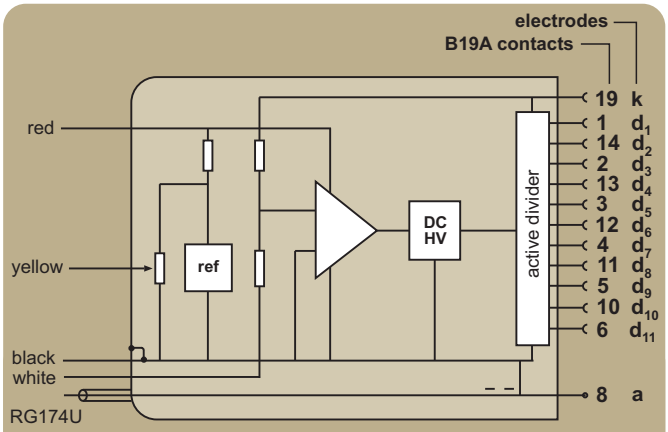
4 specification

input power at V_{max} = -1800 V	+5 V, 65 mA
power conversion efficiency, P_O / P_{in}	40 % for +5 V
input power at V_{max} = -1800 V	+12 V, 20 mA
power conversion efficiency, P_O / P_{in}	50 % for +12 V
output voltage range	-100 V to -1800 V
line regulation	0.05 % /V
temperature coefficient	<0.02 % $°C^{-1}$
warm up time to 0.3 % of final o/p	< 2 s
discharge time to <40 V with no load	< 2 s
maximum anode current, continuous	100 µA
anode ripple with 100 k //5 pF load	100 µV
weight	80 g

5 ratings

input voltage (PS1817/5)	+4.75 V to +6.0 V
input voltage (PS1817/12)	+12 V to +15 V
control voltage	0 to +1.8 V
temperature (operating)	+ 5 °C to +55 °C

6 schematic diagram



example of output voltage with 1.300 V applied to control (white) wire

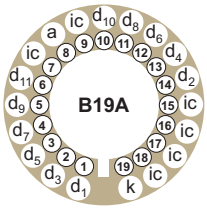
contact	electrode	voltage	contact	electrode	voltage
1	d_1	-1100	11	d_8	-400
2	d_3	-900	12	d_6	-600
3	d_5	-700	13	d_4	-800
4	d_7	-500	14	d_2	-1000
5	d_9	-300	15	nc	-
6	d_{11}	-100	16	nc	-
7	nc	-	17	nc	-
8	a	floating	18	nc	-
9	nc	-	19	k	-1300
10	d_{10}	-200			

nc - no connection

7 voltage distribution

The photomultiplier pin configuration compatible with this power base is given below. Note that an anode load resistor is not included.

view from below



k	d_1	d_2	d_{10}	d_{11}	a
2/13 V	1/13 V	.....	1/13 V	1/13 V	

note: V is the high voltage, HV

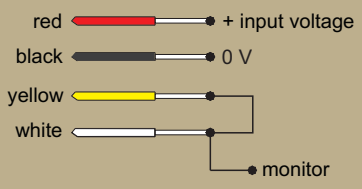
8 sleep mode

The power consumption can be reduced by half to one third of its normal level by activating the sleep mode. This is done by taking the control voltage (white) to 0 V.

9 programming options

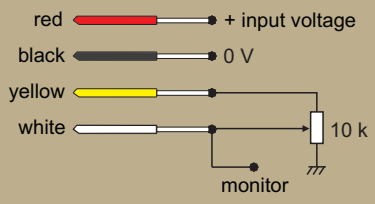
internal potentiometer
(access from back of power supply, clockwise to increase HV)

1)



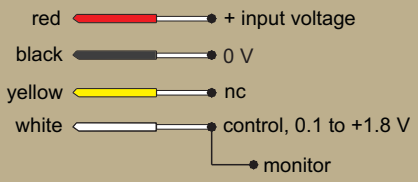
external potentiometer

2)



external voltage

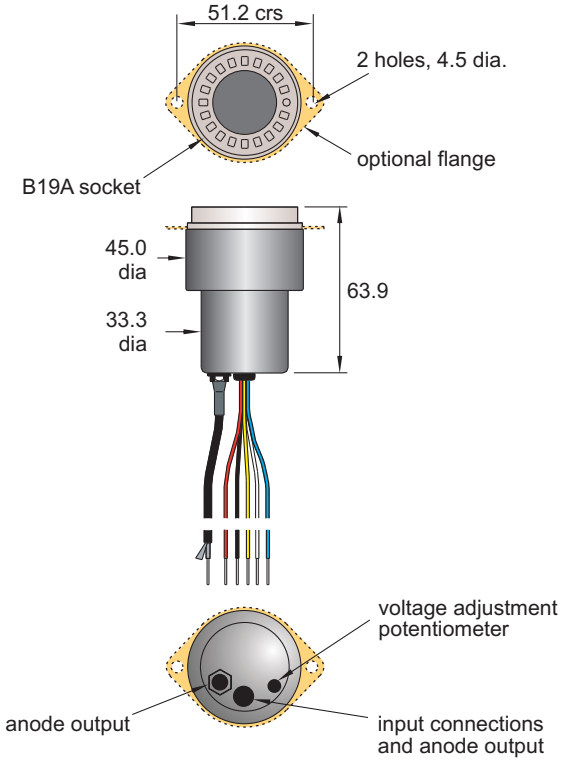
3)



nc: no connection - isolated lead
voltage monitor: 1/1000 of the HV applied to photomultiplier

10 outline drawing (mm)

All input connections are 7/0.2 PVC covered, 0.5 m in length. The anode lead is RG174U, also 0.5 m in length.



11 ordering information

item	ordering code
PS1817, +5 V	PS1817/5
PS1817, +5 V, flange	PS1817/5F
PS1817, +12 V	PS1817/12
PS1817, +12 V, flange	PS1817/12F

12 warning

High voltages generated by these products present an electrical shock hazard and appropriate precautions must be taken. They must be installed by qualified personnel and operated within the specified ratings.

The PS1817 is despatched with the internal potentiometer set to zero.

Do not operate outside the ratings limits. This may result in loss of performance or permanent damage to the PS1817. Do not exceed the ratings of the photomultiplier as this may damage the photomultiplier and the power supply.

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